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As compared with the second edition, a somewhat fuller discussion is given to diseases caused by fungi as a whole, and particularly to Ustilagineæ and Uredineæ. The injuries caused by lightning are much more extensively treated than in the previous edition, being given over fourteen pages and twenty-six figures instead of two pages and no figures. The number of figures in the book as a whole has been more than doubled, many being reproductions of photographs to show the habit of certain diseases, while others are detailed drawings made by the author. The colored plate which appeared in the first edition has been retained. In view of the great activity shown in recent years in the study and description of bacterial diseases of plants it seems peculiar to find only two pages devoted to this important subject. Practically the same introductory remarks are given as in the second edition, to the effect that bacterial diseases of plants are not and cannot be numerous in the nature of things, owing to the firm cellulose walls and acid sap characteristic of most plants. But five bacterial diseases are mentioned, two being considered as not yet proved. They are the yellow rot of the hyacinth, the wet rot of the potato, pear blight, and more doubtfully sorghum blight, and the twig gall of the olive. It seems strange that no mention is made of several other economically very important bacterial diseases which have been so carefully and fully described by European and American investigators. A very noticeable feature is the fact that except for a few citations in the introduction to general works, all the publications cited are those by the author himself. He explains this as being done to make these publications more available, since they are scattered through numerous periodicals, etc. There is no need, he believes, for a general bibliography in such a work.

The typography is good, and the figures are mostly excellent. The only typographical error noted is in the legend to *figure 123*, where the name Cryptospora is printed instead of Calyptospora. As a whole the book is likely to prove valuable, not as a general work, however, but rather as a text-book of diseases of trees.—ERNST A. BESSEY.

MINOR NOTICES.

HERMAN B. DORNER (Proc. Ind. Acad. Sci. 1899: 116–129) has investigated the resin ducts and strengthening cells of the leaves of six species of Abies, and five of Picea, and has discovered differences which enable him to distinguish them. The paper contains text cuts showing the varying structures.—J. M. C.

THE LAST NUMBER of the *Icones Florae Japonicae* bears the date September 1, 1900, and is no. 8 of the spermatophyte and pteridophyte series, edited by T. Makino of the Imperial University at Tōkyō. The present number contains illustrations of species of Davallia, Aldrovanda, Stigmatodactylus, and Saccolabium.—J. M. C.

THE FIFTH FASCICLE of Engler's work on the genera and families of African plants[6] has just appeared, containing Professor Schumann's presentation of the Sterculiaceæ. The genera are 16 in number, and the species 211, the large genus being Hermannia with 73 species. The appearance of these monographs is sumptuous, and the plates are beyond praise.—J. M. C.

A NOTICE of the appearance of the first fascicle of Halácsy's *Flora of Greece* was published in this journal for April last (**29**: 290. 1900). In that notice the occasion for the work and its general character were set forth. The second fascicle[7] has now appeared, and completing Alsinaceæ continues to the beginning of Crassulaceæ. The sequence is that of Bentham and Hooker.—J. M. C.

THE FIRST REPORT of the Michigan Academy of Science has appeared. Its numerous papers indicate a strong and promising organization. The botanical contributions, aside from some general papers by Professor Beal, are as follows: The flora of Michigan lakes, and Teratological forms of *Trillium grandiflorum*, besides several abstracts, by CHARLES A. DAVIS; On saprophytic fungi in the vicinity of the Agricultural College, by B. O. LONGYEAR.—J. M. C.

MR. G. E. STONE, of the Massachusetts Agricultural College, has published a list of the plants of Lake Quinsigamond, a lake near Worcester, and one of the largest in Massachusetts. The flora is evidently one of great interest, and includes some plants which are restricted in central Massachusetts to this lake and its tributaries. The summary shows 88 spermatophytes, 4 pteridophytes, 15 bryophytes, and 331 thallophytes (319 of which are algæ), making 450 species in all.—J. M. C.

ALEXANDER W. EVANS (Proc. Wash. Acad. Sci. **2**: 287–314. *pls. 16–18.* 1900) has just published a paper on the Hepaticae collected in Alaska by the Harriman expedition. There were collected sixty-three species in a condition to be identified, thirty-eight of which are recorded from Alaska for the first time. There are known in Alaska at present eighty-two species of Hepaticae, sixty-seven of which belong to the Jungermanniales. No representatives of the Ricciaceae or of the Anthocerotales are as yet definitely known from the territory.—J. M. C.

LESTER F. WARD (Amer. Jour, Sci. **10**: 327–345. *pls. 2–4.* 1900) has described a number of new species belonging to his genus Cycadeoidea. These cycadean trunks are from the Black hills. The described species now number twenty-nine, and all of them are represented in the collections of the Yale museum. Professor Ward ventures the opinion that we are only upon the threshold of knowledge in reference to the extinct floras of America, and he voices the hope of botanists by stating that "as we penetrate deeper into the inner structure, it is safe to predict that the results will be such as even the botanists proper cannot afford to ignore."—J. M. C.

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[6] ENGLER, A.: Monographien afrikanischer Pflanzenfamilien und -Gattungen. V. Sterculiaceæ, bearbeitet von K. Schumann. 4to. pp. 140. *pls. 16.* Leipzig: Wm. Engelmann. 1900. *M* 30.

[7] HALÁCSY, E. DE.: Conspectus Florae Graecae. Vol. I. fasc. II, pp. 225–576. Leipzig: Wilhelm Engelmann. 1900. *M* 8.

DR. SMITH ELY JELLIFFE[8] has published a catalogue of the flora of Long Island. His reason for publishing a single list for an island which possesses numerous local floras " lies in the peculiar features of botanical interest that are caused by the position of the island in relation to the mainland, and the history of the growth of plant life on the Atlantic slope, as shown by the combined evidence of geology and botany on Long Island." The author makes an interesting attempt to relate the present flora to what he calls "geological floras." The following statistics of the flora are given: Thallophytes, 719; Bryophytes, 136; Pteridophytes, 41; Spermatophytes, 1342 (Gymnosperms 14, Monocotyledons 322, Dicotyledons 1006); total number of known species 2238.—J. M. C.

FASCICLES 202 and 203 of Engler and Prantl's *Die natürlichen Pflanzenfamilien* have appeared as a double fascicle, completing the first part of the first volume. It is devoted entirely to Flagellata, by G. Senn. The general structure of these somewhat problematical organisms is dealt with in a very satisfactory way. A summary of the group shows the following statistics: seven orders, twenty families, 128 genera, and about 350 species. One cannot but remark the great preponderance of monotypic genera.

The first supplement to this work has also just been issued, including the new material of the year 1897–8 for volumes II–IV. It contains not only the new genera which have been described, but also references to important additional literature. The continuation of these supplements will be of very great value.—J. M. C.

A. A. HELLER has issued a second edition of his "*Catalogue of North American Plants north of Mexico,* bearing the date of November 10, 1900. The first edition was issued in March 1898, since which time the editor states that about two thousand new plant names have been published. The second edition possesses all of the features desirable in a catalogue of this nature; the page is printed upon one side only, giving space for the insertion of new names; larger type has been used than in the previous edition, and the press work is beyond criticism. Such complete lists are absolutely essential to the taxonomist and to those interested in building up collections. The editor gives the interesting calculation that "at the present rate of activity in taxonomic botany, the year 1905 will see twenty thousand plant names to be

[8] The flora of Long Island. 8vo. pp. xvi + 160. Lancaster, Pa.: The New Era Printing Co. 1899. $1.

listed and many changes in generic limits." The list of names is preceded by five pages of changes in nomenclature, which of course involves the citation of the synonyms.—J. M. C.

THE *Flora of the West Indies*, by Urban,[9] has reached the second fascicle of the second volume. The two previous fascicles were noticed in this journal for April last (**29**: 289. 1900). The new fascicle contains the conclusion of the Cyperaceæ by C. B. Clarke, followed by Urban in a long list of corrections of nomenclature and spelling of generic names in the family more in accordance with modern views. The Acanthaceæ are presented by G. Lindau, 37 genera and 90 species being recognized, the new genera being *Drejerella*, *Ancistranthus*, and *Centrilla*. *Dianthera* is merged under *Justicia*. New species of Lauraceæ and Bromeliaceæ are described by C. Mez. "New or little known Leguminosae" is the title of a series of papers by I. Urban, the first one containing about 30 new species, the majority of which belong to *Caesalpinia* and *Galactia*. The new genera are *Hebestigma* (founded on *Robinia? Cubensis* HBK.) and *Rhodopis* (founded on *Erythrina planisiliqua* L.).—J. M. C.

THE PUBLICATION of a state flora does not mean very much in these days unless it devotes considerable attention to the ecological standpoint. The new state flora of Indiana[10] is particularly welcome because of the full ecological as well as geographical notes in connection with each species. Instead of being a mere list, valuable only to the collector, there is material of value to all botanists. In the introduction the physiographic features, climate, and soils are described briefly, and then the author discusses the plant societies. After a statement of general principles, the hydrophytes, xerophytes, and mesophytes are treated in order, especial attention being given to the xerophytes. Topics of more general economic interest come next, notably reforestation, poisonous plants, and weeds. A very complete bibliography closes the introduction, and the remainder of the book (400 pp.) gives a detailed account of the various species. Through an unfortunate oversight the reprint is not dated, nor is there any indication as to its source. —H. C. COWLES.

T. C. PALMER and F. J. KEELEY (Proc. Acad. Nat. Sci. Philad. **1900**: 465–479. *pls. 15, 16*) have published concerning the structure of the diatom girdle. They have noticed that in all literature upon diatoms there is a tendency to neglect the structure of the girdle and to take for granted that it is everywhere the same, and that it is a typically closed hoop. Their present claim is that the closed hoop structure is unusual. They make the statement that "with some very important exceptions, the girdle is a two-ended band of silica, with the ends variously and characteristically rounded or otherwise modified, and approximated or overlapping without being joined. The position of the gap or joint is, within limits, constant in a given genus with relation to salient features of the valves. In case of each simple pair of primary girdles, the two gaps are usually at opposite points of the diatom; and in general, in the forms we have studied, the gaps are normally so situated with respect to each other as to 'lap joints.'" These claims are supported by the presentation of typical examples.—J. M. C.

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[9] URBAN, IGNATIUS: Symbolae Antillanae seu fundamenta florae Indae occidentalis. Vol. II, fasc. 2, pp. 161–335. Berlin: Gebrüder Borntraeger. 1900. *M* 9.90.

[10] COULTER, STANLEY: A catalogue of the flowering plants and of the ferns and their allies indigenous to Indiana. Separate reprint from Report of the Indiana State Geologist, 1899, pp. 553–1074.

NOTES FOR STUDENTS.

THE EFFECT of certain inorganic salts in accelerating the growth of lower plant organisms has recently been made the subject of research by N. Ōno.[11] He has worked with the following substances in very dilute solutions: $ZnSO_4$, $FeSO_4$, $NiSO_4$, $CoSO_4$, $CuSO_4$, $HgCl_2$, $LiNO_3$, NaF, and K_2AsO_3. For fungi *Aspergillus niger* and *Penicillium glaucum* served as subjects; for algæ (and this is the first time this group has been brought under experimentation in this regard), *Protococcus* sp., *Chroococcum* sp., *Hormidium nitens*, and *Stigeoclonium* sp. Suitable nutrient fluids were used unmodified for the control cultures, and with addition of one of the above-named salts for the tests.

With the exception of $CuSO_4$ and $HgCl_2$, all of the salts, in very dilute solution, act upon the algæ to accelerate vegetative growth and to retard the process of zoospore production. All of the salts act in this way upon the fungi studied; in this the author is in accord with Richards.[12] For the algæ the optimum growth is obtained by addition of a much smaller amount of the unusual salt than for the fungi. In the former case the concentration of this compound varies from $\frac{1}{2,500,000}$ to $\frac{1}{100,000}$ gram molecule per liter; in the latter from $\frac{1}{4000}$ to $\frac{1}{800}$ gram molecules per liter. Sixteen pages of tables give the results very clearly. The author has been content to determine the facts as stated above, without inquiring more deeply into their nature. He seems to make the mistake of considering his salts as remaining intact in these dilute solutions, instead of being completely dissociated, as they almost certainly are. It is very probable that (excepting in case of

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[11] Ueber die Wachstumsbeschleunigung einiger Algen und Pilze durch chemische Reize. Jour. Coll. Sci. Imp. Univ. Tōkyō. **13**: 141–186. *pl. 13*. 1900.

[12] Die Beeinflussung des Wachsthums einiger Pilze durch chemische Reize. Pringsh. Jahrb. f. wiss. Bot. **30**: 665. 1897.